Design and Implementation of a Physics GTA Development Program

Emily Alicea-Muñoz
School of Physics, Georgia Institute of Technology
AAPT 2015 Summer Meeting, 29 July 2015

Collaborators:
Carol Subiño Sullivan (CETL)
Michael F. Schatz (SoP)
Background

• **The Old Way: “TA Training”**
  - Disjointed training elements; low TA motivation; lack of transferable skills

• **The New Way:**
  **Integrate** Physics, Pedagogy, and Professional Development
  - One-semester course for first year PhD students
    - Cycle 1 – Fall 2013 (22 GTAs)
    - Cycle 2 – Fall 2014 (13 GTAs)
    - Next: Cycle 3 – Fall 2015 (34 GTAs)
  - Curriculum revisions every year based on past results and GTA feedback
  - Ongoing longitudinal study to assess program effectiveness
The Three P’s

• **Physics** – content is important
  • Need to make sure GTAs know the material well enough to teach it

• **Pedagogy** – how to teach is important
  • Just because GTAs know physics doesn’t mean they know how to teach it or how to help students learn it

• **Professional Development** – preparation for their future careers is important
  • GTAs are better motivated when they can see how teaching helps them achieve their professional goals

• **Integration** – all three elements must correlate and work with each other to better prepare GTAs
Fall 2014

Pedagogy

Classroom observations

Need more, and more varied videos

“Not useful” (2014 only)

Not enough

Problem solving

Active learning

Grading

Micro-teaching

Midterm evaluations

Being a physics TA

Preconceptions

Physics

Professional development

Leadership

Time management

GT policies

Problematic

Highly rated (2013 and 2014)

Long and redundant

Need more, and more varied videos

“Not useful” (2014 only)

Not enough

Problem solving

Active learning

Grading

Micro-teaching

Midterm evaluations

Being a physics TA

Preconceptions

Physics

Professional development

Leadership

Time management

GT policies

Problematic

Highly rated (2013 and 2014)

Long and redundant
Changes for Fall 2015

- **Pedagogy**
  - Instructor observations AND peer observations
  - More discussion of video observations
  - More on giving and receiving teaching feedback

- **Physics**
  - More problem-solving, including during microteaching
  - Grading practice (“micrograding”)
  - Expert/novice issues
  - Anticipating student questions

- **Professional Development**
  - “Teaching and Research”
  - Guest faculty speakers
  - More mentoring
PEDAGOGY
- classroom observations
- peer observations
- teaching videos

active learning
- micrograding
- teaching feedback

classroom management
- micro-teaching
- midterm evals

faculty support

PROFESSIONAL DEVELOPMENT
- gt policies
- mentoring
- time management

expert/novice
- preconceptions

PHYSICS
- problem solving
- student questions

Fall 2015
- successful first day
- classroom
- teaching and research
- transferable skills